Dark energy with polytropic equation of state

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Equation of state parameter plays a significant role for guessing the real nature of dark energy. In the present paper polytropic equation of state $p = \omega\rho^n$ is chosen for some of the kinematical Λ-models viz., $\Lambda \sim (\dot{a}/a)^2$, $\Lambda \sim \ddot{a}/a$ and $\Lambda \sim \rho$. Although in dust cases (where pressure p being zero $\omega = 0$) closed form solutions show no dependency on the polytropic index n, but in non-dust situations some new possibilities are opened up including phantom energy with supernegative ($\omega < -1$) equation of state parameter.